Introduction

Cadmium (Cd) is a toxic metal found in soil, air, water, and living things. It can be released naturally from mineral deposits or deposited by anthropogenic activity, such as metal smelting, use of phosphate fertilizers and burning of fossil fuels. Cd can also be found in fish, shellfish, and some crops grown in areas contaminated with Cd. In the environment, Cd can be found in sediments, soils, and water bodies. This metal is non-volatile and is transported through food chains.

Materials and Methods

Results: Age Study

As shown in Table 1 and Fig. 4, all-age Cd concentrations were below the 3.7 ppm level of concern set by the Food and Drug Administration (FDA) and the 2 ppm Hong Kong import standard. The 1-yr old oysters had a significantly lower Cd concentration (3.2 ppm) compared to the older age classes. Although there was no statistical difference among the 2-, 3- and 4-yr classes, there was a trend for the 2- and 3-yr olds to have slightly higher Cd concentrations than the 4-yr olds. These results indicate that Cd concentrations in Pacific oysters follow a similar pattern to those observed in other shellfish species.

Table 1. Results of oyster age study showing mean, std. dev., oyster Cd, tissue wt. and sediment Cd concentration (ppm).

<table>
<thead>
<tr>
<th>Age (yr)</th>
<th>Oyster wt. (g)</th>
<th>Sediment Cd (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.2±0.3</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>3.0±0.2</td>
<td>0.02</td>
</tr>
<tr>
<td>3</td>
<td>3.5±0.1</td>
<td>0.04</td>
</tr>
<tr>
<td>4</td>
<td>3.0±0.1</td>
<td>0.08</td>
</tr>
</tbody>
</table>

The Cd concentration (ppm) varied significantly with age (p < 0.05), indicating that Cd concentrations increase with age in Pacific oysters. This is consistent with previous studies that have shown a positive correlation between Cd concentration and age in Pacific oysters.

Materials and Methods

Results: Tissue Weights Study

As shown in Fig. 6, there was a significant increase in estimated Cd per oyster among the 1- and 2-yr old classes, with ave. Cd concentration of 1.04, 1.06 and 1.11 ppm, respectively. These results indicate that Cd concentrations in Pacific oysters increase with age, consistent with previous studies.

Conclusions

- Age Study
  - There was some effect of age on Cd concentrations in 2-yr old oysters, but it was not statistically significant.
  - There was no significant difference in Cd concentrations among the 2-, 3- and 4-yr old classes.

- Tissue Weights Study
  - There was an effect of oyster tissue weight on Cd concentrations, with an R-squared value of 0.37 for all 100 oysters analyzed in the tissue weights study.

References


Acknowledgements

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